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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/090,588	02/28/2002	Ulrich Kalmbach	AO600	5004

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EXAMINER

RO, BENTSU

ART UNIT

PAPER NUMBER

2837

DATE MAILED: 08/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n No.

10/090,588

Applicant(s)

KALMBACH, ULRICH

Examiner

Bentsu Ro

Art Unit

2837

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-5,7,9-13 and 15-17 is/are rejected.
- 7) ☒ Claim(s) 6,8 and 14 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3. 6) ☐ Other:

FIRST OFFICE ACTION

1. Page 9 of the specification is a photocopy with correction. This page is not clear, a new substitute page is required.
2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:
A person shall be entitled to a patent unless -
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
3. Claims 1-3, 9-11, 15 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Grandjean et al US Patent No. 4,514,676.

Claims read onto Grandjean et al teaching as follows:

The claims:

Claim 1. A bi-directional stepping motor in which a rotor is rotatable in steps of 180 degrees each,

the stepping motor comprising:

a rotor comprising a permanent magnet and rotatably mounted about an axis and providing a permanent magnetic field;

a first electrical coil and a second electrical coil;

a stator comprising:

three pole faces arranged around the rotor,

a first arm on which the first electrical coil is mounted; and

a second arm on which the second electrical coil is mounted;

Grandjean et al teaching:

see abstract line 2 for a bidirectional stepping motor and see column 1, line 25 for a 180° of rotation;

Fig. 1 shows a rotor having a shaft 5 and permanent magnetic poles N and S;

Fig. 1 also shows windings 9 and 10;

Fig. 1 shows three pole faces 1d, 1e and 1f;

Fig. 1 shows a component 2, the component 2 has two arms 2d, one on the left and the other on the right;

the winding 9 is mounted on the left arm and the winding 10 is mounted on the right arm;

a control circuit, coupled to the first and second electrical coils

for applying electrical pulses independently to each coil and for controlling the polarity thereof,

the coils producing magnetic field in response to the pulses

and wherein the rotor is rotatable in response to the magnetic fields;

wherein each step of 180 degrees is effectuated by providing to the first coil, a first pulse of a first polarity

and a second pulse of a second polarity;

Fig. 14 shows a third embodiment control circuit;
the outputs of the third embodiment control circuit control the gates G1-G6 of three half-bridge arms shown in the upper-right corner of Fig. 5 circuit;
the three half-bridges connect to the windings 9 and 10 as clearly shown in Fig. 5 upper-right corner;

Figs. 15a and 15b show electrical pulses I9 and I10 which are electrical pluses applied to the windings 9 and 10 independently, the polarity of the electrical pulses are also shown therein;
the duration and polarity of these pulses are controlled by the gate signals G1-G6 via the three half-bridge arms;

Fig. 13 shows the directions of magnetic field C9 produced by winding 9 and magnetic field C10 produced by winding 10;

Fig. 13 also shows two columns Rb1 and Rb2 which are the direction of rotor rotation due to the magnetic field of winding energization;

Fig. 13, the block across row A1 and column I9, wherein winding 9 is energized by a pulse of negative polarity (-);
thus, the negative polarity is a first polarity;

the block across row A3 and column I9, wherein the winding 9 is energized by a pulse of positive polarity (+);
thus, the positive polarity is a second polarity;

and to said second coil, a pulse of the second polarity simultaneously with the providing of the second pulse to the first coil;

the block across the row A3 and column I10, wherein the winding 10 is energized with a positive polarity (the second polarity) simultaneously with winding 9 energizing with the same positive polarity (column I9);

Fig. 13, the block across row A1 and column Ra, it shows an initial position of the rotor; the block across row A3 and column Rc, it shows a final position of the rotor; thus, from initial position to the final position, the rotor has rotated 180° in a counterclockwise direction (or a positive direction as defined by Grandjean et al);

wherein during the providing of the first pulse to the first coil, there is no pulse being provided by the second coil.

across row A1 and column I10, the block is empty, namely, no pulse has been applied to the winding 10 during the first pulse is applied to the winding 9 (across row A1 and column I9).

Claim 2. The stepping motor as claimed in claim 1, wherein the rotation of the second 180 degree step is achieved by providing:

Fig. 13 shows rows B1 through B3, the B1-B3 is the rotation of the rotor in the second 180°;

to the first coil, a third pulse of the second polarity

the block across row B1 and column I9, it shows winding 9 pulsed with a third pulse of second polarity (+);

and a fourth pulse of the first polarity;

the block across row B3 and column I9, it shows the winding 9 pulsed with a fourth pulse of the first polarity (-);

and to said second coil, a pulse of the first polarity simultaneously with the providing of the fourth pulse to the first coil;

the block across B3 and I10, the winding 10 is pulsed with a negative polarity simultaneously with the pulse to winding 9 with the same negative polarity;

wherein during the providing the third pulse to the first coil, there is no pulse being provided to the second coil.

the block across B1 and I10, there is empty, thus, there is no pulse being applied to the

winding 10 when winding 9 is energized with a positive polarity pulse.

Claim 3. The bi-directional stepping motor as claimed in claim 1, wherein the three pole faces are arranged at an angular spacing of approximately 120 degrees with respect to each other.

Fig. 1 shows three pole faces 1d, 1e, 1f, the spacing is approximately 120 degrees therebetween.

Claim 9. (And similar claim 15.) The stepping motor as claimed in claim 1, wherein the stepping motor is incorporated into a wristwatch.

See abstract last line wherein it states that the stepping motor is being used in a timepiece; the timepiece, of course, includes a wristwatch.

Claims 10 and 11 are respectively similar but broader than that of claims 1 and 2, discussion is omitted.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 4, 5, 7, 12, 13, 16, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grandjean et al.

Regarding independent claims 4, 7 and 12, Grandjean et al Fig. 3 shows a row A wherein the winding 10 is energized to rotate the rotor approximately 135 degrees, after that, all windings are de-energized and the rotor automatically rotates the remaining (180- 135) degrees to its rest position.

Thus, Grandjean does teach the rotor rotation of X degrees (135°). However, in Fig. 1 Grandjean does not teach the energization of windings to rotate the rotor of the remaining (180-X) degrees as claimed in the last paragraph of each independent claim.

Yet, in a separate embodiment of Fig. 13, the rotation of the remaining angle can also be accomplished by energizing the windings to the rotor so that the rotor can rotate to its rest position, such as in rows A3, B3, etc.

In view of the foregoing, it would have been obvious to a skilled person in the art to add the energization of A3 or B3, etc to the steps of Fig. 3 next to rows A, B, etc to achieve the same subject matter as claimed.

Why ??? The step of Fig. 3 energizes the winding to rotate the rotor 135° and then the rotor will automatically rotate the remaining angle to its rest position. This type of scheme may have problem if friction existed. Adding the A3, B3 steps guarantee that the rotor will move to its rest position without any difficulty.

Claims 5 and 13 are similar to that of claim 2. The rejection of these two claims is basically the same as discussed above.

Claims 16 and 17 are identical to that of claim 15, discussion is omitted.

6. Claims 6, 8, 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

It appears to the examiner that the subject matter of rotating the rotor 30° and then rotate 150° to its rest position is not taught by Grandjean et al.

Grandjean Fig. 10 shows a rotation to 45° , and then to 135° , and then to 180° . The angle 45° can be between 30° and 60° , see column 3, lines 21-26. There is no teaching of 0-30-180 degrees rotation by Grandjean et al.

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

8. Any inquiry concerning this communication should be directed to Bentsu Ro at telephone number 703 308-3656.

August 7, 2003

Bentsu Ro
Bentsu Ro
Primary Examiner